

REMARKS

The above amendments and these Remarks are in reply to the Final Office Action mailed March 26, 2007. Claims 3-15, 18-21, 32, 37, 39, 41, 42 44-60, 62, 64 and 66 were pending in the Application prior to the outstanding Office Action. In the Office Action, the Examiner rejected claims 3-15, 18-21, 32, 37, 39, 44, 45, 47-49, 51-53, 55-57, 59, 60, 62, 64 and 66. Claims 41, 42, 46, 50, 54 and 58 were previously withdrawn from consideration. The present Response amends claims 3-6, 8, 12-15, 21, 60, 62, 64 and 66 and cancels withdrawn claims 41, 42, 46, 50, 54 and 58 for pursuit in a divisional application, leaving for the Examiner's present consideration claims 3-15, 18-21, 32, 37, 39, 44, 45, 47-49, 51-53, 55-57, 59, 60, 62, 64 and 66. Reconsideration of the rejections is respectfully requested.

I. Finality of Office Action

The Examiner made the present Office Action final, writing that “all claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114.”

Applicants submit that amending the claims to recite “exciting the precursor with a radio frequency (RF) power via the annular plasma” is meant to draw a distinction from methods including a plasma generated from a mixture of plasma gas and reactant (such as taught in *Zarowin*), a scope with which the Examiner originally assigned the claims, therefore the invention is intended to be different from that which was applied by the Examiner, and not “the same”. Although the Examiner ultimately concludes in the present Office Action that “at least some indirect excitation of the precursor will occur,” Applicants believe the previous amendment to be substantive. Applicants respectfully request reconsideration of the finality of the Office Action in light of the intent to shift the Examiner’s construction of the claim (thereby drawing the claims to a ‘different’ invention).

II. Rejection under 35 U.S.C. § 103

1. Claims 3, 5-12, 18, 20, 21, 32, 37, 39, 44, 45, 47-49, 51-53, 55, 60, 62, 64 and 66 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Zarowin et al.* in “Rapid, Non-Contact, Damage Free Shaping of Optical & Other Surface with Plasma Assisted Chemical Etching, 43rd Annual Symposium on Frequency Control 1989, 623-626” in view of *Bohm et al.* in DE 199 25 790. Applicants respectfully traverse the rejection.

Zarowin discloses Plasma Assisted Chemical Etching (PACE) comprising a capacitively coupled plasma for ionizing a process gas for reacting with a surface. See Fig 1, showing two schemes for capacitively coupling the plasma using two electrodes. As *Bohm* points out,

Zarowin's approach suffers from the disadvantage that "the generated plasma only emerges beyond the edge of the opening in the electrode arrangement by between a few tenths of a millimeter and a few millimeters [and] has the result of making the local action of the plasma highly dependent on distance..." See *Bohm*, col. 3, lines 18-31. As the present specification points out, "A major limitation of the capacitively coupled discharge is the requirement that the workpiece be either conductive or less than 10 mm thick." See page 5, lines 10-15. *Bohm*'s approach is to generate plasma using a microwave system, which is capable of exciting electrode-less gas discharges. The "inert or reactive" gases are delivered to the open end (9) of the coaxial conductor (3a,3b), where the microwave radiation is channeled via the coaxial conductor to excite the gases. See col. 6, lines 39-56.

However, nowhere does *Zarowin* in view of *Bohm* teach or suggest "applying a current to the load coil to inductively couple a radio frequency (RF) power to the plasma gas" as recited in claims 3, 5, 6, 8, 12, 21, 60, 62, 64 and 66. Referring to FIGs. 1 and 2 of the present application, a load coil arranged at a distal end of the outer gas inlet tube so that the outer gas inlet tube is nested within the load coil. When a time-varying electric current is applied to the load coil, it creates a time varying magnetic field around it, which in turn induces electric currents in the plasma gas, leading to break down and formation of plasma.

Further, it's noted that *Bohm* does not specifically teach supplying a separate flow of a precursor into the annulus center of an annular plasma. Referring to Figure 1 (Example 1), *Bohm* discloses "supply (5) of the inert or reactive gases employed (Ar./He or SF₆/CF₄) is affected at the end of the coaxial conductor via inner conductor (3b)." See col. 6, lines 51-55. Thus, for the set-up of Figure 1, Example 1, the gas is inert or reactive, or a mixture of the two. Referring to Figure 5 (Example 2), *Bohm* discloses that "Gas intake into the inner conductor of coaxial conductor (3b)...is affected via supply connection (5)." See col. 7, lines 29-34. Again, there is no mention of separate gas flows. Referring to claim 1, *Bohm* claims "the reactive plasma beam is effect by diffusing a gas...wherein the chemically reactive species is either contained in this gas or generated in the plasma discharge from at least one of its components."

Still further, nowhere does *Zarowin* in view of *Bohm* teach or suggest "an auxiliary gas inlet tube concentrically arranged within the outer gas inlet tube...injecting an auxiliary gas into the auxiliary gas inlet tube to at least partially shield the inner gas inlet tube from the annular plasma" as recited in claims 3, 5, 6, 8, 12, 21, 60, 62, 64 and 66.

Because *Zarowin* in view of *Bohm* fails to teach or suggest all of the features of claims 3, 5, 6, 8, 12, 21, 60, 62, 64 and 66, *Zarowin* in view of *Bohm* cannot render claims 3, 5, 6, 8, 12, 21, 60, 62, 64 and 66 obvious under 35 USC 103(a). Dependent claims have at least the features

of the claims from which they depend, therefore *Zarowin* in view of *Bohm* cannot render claims 7, 9-11, 18, 20, and 32 (which depend from claim 21), 44, 48, and 52 (which depend from claim 60), 37, 45, 49, and 53 (which depend from claim 62), and 39, 47, 51 and 55 (which depend from claim 66) obvious under 35 USC 103(a)

2. Claims 3-12, 19-21, 32, 37, 39, 44, 45, 47-49, 51, 60, 62, 64 and 66 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Bollinger et al.* in “Rapid, Non-Contact Optical Figuring of Aspheric Surfaces with Plasma Assisted Chemical Etching (PACE)”, in SPIE Vol. 1333 page 44-57 in view of *Zarowin* and further in view of *Bohm*. Applicants respectfully traverse the rejection.

As noted by the Examiner, “it is readily apparent that the system and process of *Bollinger* and *Zarowin* are essentially the same.” See page 5. Therefore, for the reasons given above in 1., *Bollinger* in view of *Zarowin* and further in view of *Bohm* fail to teach or suggest all of the features of claims 3-6, 8, 12, 21, 60, 62, 64 and 66, and therefore *Bollinger* in view of *Zarowin* in further view of *Bohm* cannot render claims 3-6, 8, 12, 21, 60, 62, 64 and 66 obvious under 35 USC 103(a). Dependent claims have at least the features of the claims from which they depend, therefore *Zarowin* in view of *Bohm* cannot render claims 7, 9-11, 19, 20, and 32 (which depend from claim 21), 44, and 48 (which depend from claim 60), 37, 45, and 49 (which depend from claim 62), and 39, 47 and 51 (which depend from claim 66) obvious under 35 USC 103(a)

3. Claims 13-15, 56, 57 and 59 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Bollinger* in view of *Selwyn* (US Pat. 5,961,772), in further view of *Bohm* and further in view of *Collins et al.* (US Pat. 6,068,784). Applicants respectfully traverse the rejection.

For the reasons given above in 1. and 2., *Bollinger* in view of *Bohm* fails to teach or suggest “applying a current to the load coil to inductively couple a radio frequency (RF) power to the plasma gas” as recited in claims 13-15 and 60, 62, and 66 (from which claims 56, 57 and 59 depend). *Selwyn* fails to remedy the deficiency. *Selwyn* fails to teach or suggest the missing features of “applying a current to the load coil to inductively couple a radio frequency (RF) power to the plasma gas” and “an auxiliary gas inlet tube concentrically arranged within the outer gas inlet tube...injecting an auxiliary gas into the auxiliary gas inlet tube to at least partially shield the inner gas inlet tube from the annular plasma” as recited in claims 13-15 and 60, 62, and 66. *Selwyn* teaches generating a plasma in an annular region between two concentric cylindrical electrodes. See col. 4, lines 31-36.

Further, *Collins* fails to remedy the deficiency. *Collins* fails to teach or suggest the missing feature of “an auxiliary gas inlet tube concentrically arranged within the outer gas inlet

tube...injecting an auxiliary gas into the auxiliary gas inlet tube to at least partially shield the inner gas inlet tube from the annular plasma” as recited in claims 3, 5, 6, 8, 12, 21, 60, 62, 64 and 66. *Collins* teaches (in FIG. 2) a gas injection system comprising a gas distribution ring 51 surrounding the chamber and a gas injection system comprising a top plate having a center gas inlet hole 56. The gas injection systems are not concentrically arranged, nor do they act to “at least partially shield” any component of the system.

Because *Bollinger* in view of *Selwyn*, in further view of *Bohm* and further in view of *Collins*, fails to teach or suggest all of the features of claims 13-15 and 60, 62, and 66, *Bollinger* in view of *Selwyn*, in further view of *Bohm* and further in view of *Collins* cannot render claims 13-15 and 60, 62, and 66 obvious under 35 USC 103(a). Dependent claims have at least the features of the claims from which they depend, therefore *Bollinger* in view of *Selwyn*, in further view of *Bohm* and further in view of *Collins* cannot render claims 56, 57 and 59 (which depend from claim 60, 62 and 66) obvious under 35 USC 103(a)

II. Conclusion

In light of the above, it is respectfully submitted that all of the claims now pending in the subject patent application should be allowable, and a Notice of Allowance is requested. The Examiner is respectfully requested to telephone the undersigned if he can assist in any way in expediting issuance of a patent.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 06-1325 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

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